(5) The procedure specified in § 600.209–12(a) will be repeated for each base level, thus establishing city and highway fuel economy and CO_2 emission values for each base level.

(6) [Reserved]

(7) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (a)(1) through (6) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy and CO_2 emission values for each base level.

(i) Calculate the city and highway fuel economy and CO_2 emission values from the tests performed using gasoline or diesel test fuel.

(ii) If 5-cycle testing was performed on the alcohol or natural gas test fuel, calculate the city and highway fuel economy and CO_2 emission values from the tests performed using alcohol or natural gas test fuel.

(b) *Model type.* For each model type, as determined by the Administrator, city and highway fuel economy and CO_2 emissions values will be calculated by using the projected sales and fuel economy and CO_2 emission values for each base level within the model type. Separate model type calculations will be done based on the vehicle configuration fuel economy and CO_2 emission values as determined in § 600.207, as applicable.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy and CO_2 emissions from those intended for sale in other states, he will calculate fuel economy and CO_2 emission values for each model type for vehicles intended for sale in California and for each model type for vehicles intended for sale in the rest of the states.

(2) The sales fraction for each base level is calculated by dividing the projected sales of the base level within the model type by the projected sales of the model type and rounding the quotient to the nearest 0.0001.

(3)(i) The 5-cycle city fuel economy values of the model type (calculated to the nearest 0.0001 mpg) are determined by dividing one by a sum of terms, each of which corresponds to a base level and which is a fraction determined by dividing:

(A) The sales fraction of a base level; by

(B) The 5-cycle city fuel economy value for the respective base level.

(ii) The 5-cycle city CO_2 emissions of the model type (calculated to the nearest tenth of a gram per mile) are determined by a sum of terms, each of which corresponds to a base level and which is a product determined by multiplying:

(A) The sales fraction of a base level; by

(B) The 5-cycle city CO_2 emissions for the respective base level.

(4) The procedure specified in paragraph (b)(3) of this section is repeated in an analogous manner to determine the highway and combined fuel economy and CO_2 emission values for the model type.

(5) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (b)(1) through (4) of this section shall be used to calculate two separate sets of city and highway fuel economy and CO_2 emission values for each model type.

(i) Calculate the city and highway fuel economy and CO_2 emission values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy and CO_2 emission values from the tests performed using alcohol or natural gas test fuel, if 5-cycle testing was performed on the alcohol or natural gas test fuel. Otherwise, the procedure in § 600.210–12(a)(3) or (b)(3) applies.

[76 FR 39553, July 6, 2011]

§ 600.210–08 Calculation of fuel economy values for labeling.

(a) *General labels.* Except as permitted in paragraph (e) of this section, fuel economy for general labels can be determined by two methods. The first is based on vehicle-specific model-type 5-cycle data as determined in § 600.209–08(b). This method is optional beginning in the 2008 model year for all vehicles, including medium-duty passenger vehicles, and required beginning in the 2011 model year (except for dedicated alternative-fuel vehicles, dual fuel vehicles when operating on alternative

fuel, and medium duty passenger vehicles) unless otherwise indicated according to the provisions in § 600.115–08. The second method is the derived 5-cycle method, and is based on fuel economy that is derived from vehicle-specific 5-cycle model type data as determined in paragraph (a)(2) of this section. This method is required for 2008 through 2010 model years (except for medium-duty passenger vehicles, in which case it is optional), and is permitted beginning in 2011 model year under the provisions of § 600.115–08. If the manufacturer determines that the resulting label values from either of these methods are not representative of the fuel economy for that model type, they may voluntarily lower these values. All 2011 and later model year medium-duty passenger vehicles, dedicated alternative-fueled vehicles, and dual fuel vehicles when operating on alternative fuel must be labeled for fuel economy, using the derived 5-cycle method or, at the manufacturer's option, the vehicle-specific 5-cycle method. Fuel economy label values for dual fuel vehicles operating on alcohol-based or natural gas fuel are calculated separately.

(1) *Vehicle-specific 5-cycle labels.* The city and highway model type fuel economy determined in § 600.209–08(b), rounded to the nearest mpg, comprise the fuel economy values for general fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Derived 5-cycle city and highway label values are determined according to the following method:

(i) For each model type, determine the derived five-cycle city fuel economy using the following equation and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City Fuel Economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{MT FTP FE}}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

MT FTP FE = the model type FTP-based city fuel economy determined under § 600.208–08(b), rounded to the nearest 0.0001 mpg.

(ii) For each model type, determine the derived five-cycle highway fuel economy using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway Fuel Economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{MT HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

MT HFET FE = the model type highway fuel economy determined under § 600.208–08(b), rounded to the nearest 0.0001 mpg.

(iii) For 2008 and later model year vehicles, unless and until superseded by written guidance from the Administrator, the following intercepts and slopes shall be used in the equations in paragraphs (a)(2)(i) and (a)(2)(ii) of this section:

City Intercept = 0.003259.
City Slope = 1.1805.
Highway Intercept = 0.001376.
Highway Slope = 1.3466.

The Administrator will periodically update the slopes and intercepts via guidance and will determine the model year that the new coefficients must take effect. The Administrator will issue guidance no later than six months prior to the earliest starting date of the effective model year (e.g., for 2011 models, the earliest start of the model year is January 2, 2010, so guidance would be issued by July 1, 2009.) Until otherwise instructed by written guidance from the Administrator, manufacturers must use the coefficients that are in currently in effect.

(3) *General alternate fuel label values for dual-fueled vehicles.* (i) City and Highway label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$Derived\ FE_{alt} = FE_{alt} \times \frac{5cycle_{gas}}{FE_{gas}}$$

Where:

FE_{alt} = The unrounded FTP-based model-type city or HFET-based model-type highway fuel economy from the alternate fuel, as determined in § 600.208(b)(5)(ii).

5-cycle FE_{gas} = The unrounded vehicle-specific or derived 5-cycle model-type city or highway fuel economy, as determined in paragraph (a)(1) or (a)(2) of this section.

FE_{gas} = The unrounded FTP-based city or HFET-based model type highway fuel economy from gasoline (or diesel), as determined in § 600.208(b)(5)(i).

The result, rounded to the nearest whole number, is the alternate fuel label value for dual fuel vehicles.

(ii) Optionally, if complete 5-cycle testing has been performed using the alternate fuel, the manufacturer may choose to use the alternate fuel label city or highway value result in § 600.209–08(b)(5)(ii), rounded to the nearest whole number.

(b) *Specific Labels.* The following two methods are used to determine specific labels. The first is based on vehicle-specific configuration 5-cycle data as determined in § 600.207–08. This method is optional beginning in the 2008 model year for all vehicles, including medium-duty passenger vehicles, and required beginning in the 2011 model year (except for medium-duty passenger vehicles) unless otherwise indicated according to the provisions in § 600.115–08. The second method is based on derived 5-cycle configuration data as determined in paragraph (a)(2) of this section. This method is required for 2008 through 2010 model years (except for medium-duty passenger vehicles, in which case it is optional), and is allowed beginning in 2011 model year if permitted under the provisions in § 600.115–08. If the manufacturer determines that the resulting label values from either of these methods are not representative of the fuel economy for that model type, they may voluntarily lower these values. All 2011 and later model year medium-duty passenger vehicles must be labeled for fuel economy, using the derived 5-cycle method or, at the manufacturer's option, the vehicle-specific 5-cycle method. Fuel economy label values for dual fuel vehicles operating on alcohol-based or natural gas fuel are calculated separately.

(1) *Vehicle-specific 5-cycle labels.* The city and highway configuration fuel economy determined in § 600.207–08, rounded to the nearest mpg, comprise the fuel economy values for specific fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Specific city and highway label values from derived 5-cycle are determined according to the following method:

(i) Determine the derived five-cycle city fuel economy of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City Fuel Economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{Config FTP FE}}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

Config FTP FE = the configuration FTP-based city fuel economy determined under § 600.206–08, rounded to the nearest tenth.

(ii) Determine the derived five-cycle highway fuel economy of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway Fuel Economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{Config HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Config HFET FE = the configuration highway fuel economy determined under § 600.206–08, rounded to the nearest tenth.

(iii) The slopes and intercepts of paragraph (a)(2)(iii) of this section apply.

(3) Specific alternate fuel label values for dual-fueled vehicles. (i) Specific city and highway label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$\text{Derived FE}_{alt} = \text{FE}_{alt} \times \frac{5\ \text{cycle}_{gas}}{\text{FE}_{gas}}$$

Where:

FE_{alt} = The unrounded FTP-based configuration city or HFET-based configuration highway fuel economy from the alternate fuel, as determined in § 600.206.

5cycle FE_{gas} = The unrounded vehicle-specific or derived 5-cycle configuration city or highway fuel economy as determined in paragraph (b)(1) or (b)(2) of this section.

FE_{gas} = The unrounded FTP-based city or HFET-based configuration highway fuel economy from gasoline, as determined in § 600.206–08.

The result, rounded to the nearest whole number, is the alternate fuel label value for dual fuel vehicles.

(ii) Optionally, if complete 5-cycle testing has been performed using the alternate fuel, the manufacturer may choose to use the alternate fuel label city or highway value result in § 600.207–08(a)(4)(ii), rounded to the nearest whole number.

(c) For the purposes of calculating the combined fuel economy for a model type, to be used in displaying on the label and for determining annual fuel costs under § 600.307–08, the manufacturer shall:

(1)(i) For gasoline-fueled, diesel-fueled, alcohol-fueled, and natural gas-fueled automobiles, and for dual fuel automobiles operated on gasoline or diesel fuel, harmonically average the unrounded city and highway values, determined in paragraphs (a)(1) or (2) of this section and (b)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and round to the nearest whole mpg. (An example of this calculation procedure appears in appendix II of this part); or

(ii) For alcohol dual fuel and natural gas dual fuel automobiles operated on the alternate fuel, harmonically average the unrounded city and highway values from the tests performed using the alternative fuel as determined in paragraphs (a)(3) and (b)(3) of this section, weighted 0.55 and 0.45 respectively, and round to the nearest whole mpg.

(d)(1) Label values for 2008–2010 model year automobiles (except medium-duty passenger vehicles) the city and highway values for a model type must be determined by the same method. If the manufacturer optionally chooses to determine fuel economy for a model type using the vehicle-specific 5-cycle method, that method must be used to determine both the city and highway fuel economy.

(2) For 2011 and later model year automobiles, if the criteria in §600.115–08(a) are met for a model type, both the city and highway fuel economy must be determined using the vehicle-specific 5-cycle method. If the criteria in §600.115–08(b) are met for a model type, the city fuel economy may be determined using either method, but the highway fuel economy must be determined using the vehicle-specific 5-cycle method (or modified 5-cycle method as allowed under §600.114–08(b)(2)).

(3) If the criteria in §600.115–08 are not met for a model type, the city and highway label values must be determined by using the same method, either the derived 5-cycle or vehicle-specific 5-cycle.

(e) *Fuel economy values and other information for advanced technology vehicles.* (1) The Administrator may prescribe an alternative method of determining the city and highway model type fuel economy values for general, unique or specific fuel economy labels other than those set forth in this subpart C for advanced technology vehicles including, but not limited to battery electric vehicles, fuel cell vehicles, plug-in hybrid electric vehicles and vehicles equipped with hydrogen internal combustion engines.

(2) For advanced technology vehicles, the Administrator may prescribe special methods for calculating and/or determining information other than fuel economy that is required to be displayed on fuel economy labels as specified in section 600.307–08(k) of this part. For example, the Administrator may prescribe methods to determine the city and highway electrical energy consumption values and the all electric driving range for battery electric vehicles and plug-in hybrid electric vehicles.

(f) *Sample calculations.* An example of the calculation required in this subpart is in Appendix III of this part.

[71 FR 77946, Dec. 27, 2006, as amended at 74 FR 61551, Nov. 25, 2009; 76 FR 39554, July 6, 2011]

§ 600.210–12 Calculation of fuel economy and CO_2 emission values for labeling.

(a) *General labels.* Except as specified in paragraphs (d) and (e) of this section, fuel economy and CO_2 emissions for general labels may be determined by one of two methods. The first is based on vehicle-specific model-type 5-cycle data as determined in §600.209–12(b). This method is available for all vehicles and is required for vehicles that do not qualify for the second method as described in §600.115 (other than electric vehicles). The second method, the derived 5-cycle method, determines fuel economy and CO_2 emissions values from the FTP and HFET tests using equations that are derived from vehicle-specific 5-cycle model type data, as determined in paragraph (a)(2) of this section. Manufacturers may voluntarily lower fuel economy values and raise CO_2 values if they determine that the label values from any method are not representative of the fuel economy or CO_2 emissions for that model type.

(1) *Vehicle-specific 5-cycle labels.* The city and highway model type fuel economy determined in §600.209–12(b), rounded to the nearest mpg, and the city and highway model type CO_2 emissions determined in §600.209–12(b), rounded to the nearest gram per mile, comprise the fuel economy and CO_2 emission values for general fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Derived 5-cycle city and highway label values are determined according to the following method: